85025AEK
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Lelia Cosimbescu, et al

GREEN ORGANIC LIGHT-EMITTING DIODES

Serial No. 10/662,272

Filed 15 September 2003

Group Art Unit: 1774

Examiner: Dawn L. Garrett

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Deidra L. Mack
Deidra L. Mack

August 2, 2005
Date

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir::

DECLARATION UNDER RULE 131

The undersigned, Lelia Cosimbescu, declares that:

She is a co-inventor in the present application.

She is now and has been, since the date of the present invention, an employee of the Eastman Kodak Company.

In accordance with Kodak's established procedure for preparing test samples, she submitted to Kodak research a request to prepare and test samples bearing the run number LC020614-1(A-F) prior to December 19, 2002 (date has been redacted) (See **Item 1** of the attached Exhibit A).

The date of the submission of Exhibit A is accurate and the typed information was present on the date of submission and contains comparisons A, B, and F, and inventive samples C-E; hand-written notes were entered after receiving the test results.

The following shorthand indications are decoded as follows:

DPQA or Dopant 1: diphenylquinacridone = Inv-1a

t-BuDPN or Dopant 2: di t-butylphenyl napthtacene = Inv-1b

Alq or "Emitter host": tris(8-quinolinolato)aluminum(III)

Thus Exhibit A shows the submission of samples containing a light emitting layer containing a host (Alq), an emitting first dopant (DPQA); and a stabilizing second dopant (tBuDPN).

Exhibit B includes the luminance test results for the samples of Exhibit A, LC020614 (B-F), and is dated prior to December 19, 2002 (date has been redacted at **Item 2**).

Exhibit C includes graphic stability test results (Operational Fade) represented by the luminance loss on the left axis and voltage increase on the right axis. The graph is based on numerical results as exemplified by Exhibit D for sample LC020614-1B and C dated prior to December 19, 2002 (date has been redacted at **Item 3.**)

The foregoing demonstrates that an electroluminescent device containing a host (Alq), a light-emitting first dopant (DPQA) and a stabilizing second dopant (tBuDPN), was reduced to practice by the present inventors prior to December 19, 2002.

The undersigned declares further that all statements made herein of the undersigned's own knowledge are true and all statements made on information and belief are believed to be true. These statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Lelia Cosimbescu

Lelia Cosimbescu

Date: Aug 2nd, 2005

BEST AVAILABLE COPY

EXHIBIT A

2 Green Dopant

[illegible]	LC020614-1
[illegible] date:	
[illegible] NB ref:	
[illegible] test date:	ITEM 1
[illegible]	Cosimbescu
[illegible] NB ref:	BB9615-196a
[illegible] Objective	DPQA+stabilizer
[illegible] temp.	DPQA (350)/stab(275)t-BuDPN

Can I have spls bac please of 196a

stab. eff. great.

RT fade.

Pixel label (A-F):		A	B	C	D	E	F
Substrate:		Polytronics glass					
Anode:		ITO					
Pretreatment:							
HTL material:		CFx NPB	CFx	CFx	CFx	CFx	CFx
Thickness (A)		750	750	750	750	750	750
Rate (A/s)	/	4	4	4	4	4	4
Emitter host:		Alq					
Thickness (A)		375	375	375	375	375	375
Rate (A/s)	/	3.8	3.8	3.8	3.8	3.8	3.8
Rate high/low							
EML dopant:		DPQA	DPQA	DPQA	DPQA	DPQA	DPQA
Dopant Volume %		none	0.60%	0.60%	0.60%	0.60%	0.00%
Thickness (A)		0	2.25	2.25	2.25	2.25	0
Rate (A/s)		0	.024	2.38	2.46	2.23	0
Dopant 2		t-BuDPN	t-BuDPN	t-BuDPN	t-BuDPN	t-BuDPN	t-BuDPN
		0.0%	0.0%	1.875 0.5%	3.75 1.0%	18.75 5.0%	5.0%
Thickness (A)		0	0	1.82	3.8	21.4	18.27
ETL:		Alq					
Thickness (A)		375	375	375	375	375	375
Rate (A/s)	/	3.8					
Cathode:		Mg/Ag					
Mg thickness (A)		2000	2000	2000	2000	2000	2000
Mg rate (A	/	10	10	10	10	10	10
Ag thickness (A)		200	200	200	200	200	200
Ag rate (A	/	1	1	1	1	1	1
Device data @ 20 mA		A	B	C	D	E	F
Voltage							
W/A							
Cd/A							
CIEx							
CIEy							
L (cd/m^2)							
peak wavelength							
Thickness (A)							
PEDOT thickness							
Turnon field							
% drop @ 100 h							
$T_{1/2}$ (Hour)							

BATCH 183a 282°C

t-BuDPN Temps × × 216°C 225.4°C 247.9°C 248.7°C

Standard Cell 4-Quad

>> Enter Panel ID >>
18 Characters Max

LC020614-1-F

Cell Size (cm^2): 100.0E-3

Test Date: 6/14/02
Test Start Time: 4:14 PM
Run Time (sec): 108

Quadrant "1"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1025	2.00	2.04
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.326	0.630	520.0	64.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	7.91		0.03
Yield {cd/A}	Efficacy {lm/W}		
5.13	513		

Quadrant "2"

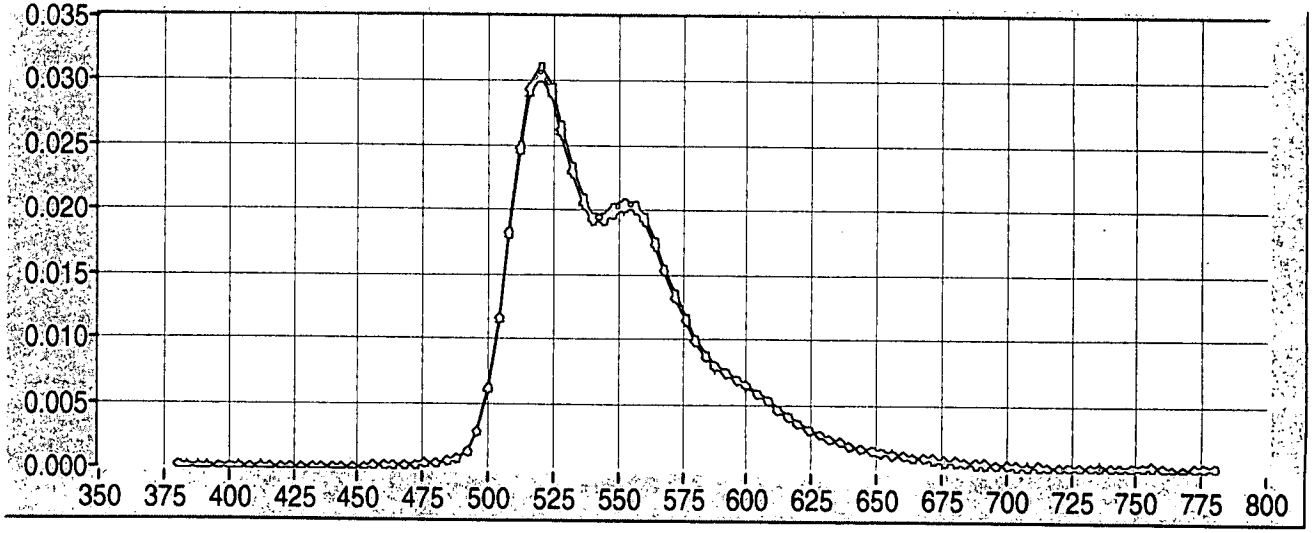
Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1052	2.05	2.08
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.326	0.630	520.0	64.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	7.96		0.03
Yield {cd/A}	Efficacy {lm/W}		
5.26	512		

Quadrant "3"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1019	1.99	2.04
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.326	0.630	520.0	64.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	7.84		0.03
Yield {cd/A}	Efficacy {lm/W}		
5.10	513		

Quadrant "4"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1029	2.00	2.08
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.325	0.630	520.0	60.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	7.79		0.03
Yield {cd/A}	Efficacy {lm/W}		
5.15	513		



Data File Pathname
z:\data\rdio data\lum4nc\LC020614-1-F LUM4NC 6930490.DAT

Write Data File? No Yes

Serial Port {0}: 0

K2400 GPIB Address: 24

Compliance Level: 25

Std Cell 4Qua i
Z:\Utilities\LabVIEW Tests\RDIO\Std Cell 4Quad.vi
Last modified on 3/12/02 at 9:31 AM
Printed on Thu 2 4:14 PM

Exhibit B

Standard Cell 4-Quad

>> Enter Panel ID >>
18 Characters Max.

LC020614-1-E

Cell Size (cm^2): 100.0E-3

Test Date: 6/14/02
Test Start Time: 4:12 PM
Run Time (sec): 130

Quadrant "1"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	950	1.81	1.76
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.326	0.633	524.0	56.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.48		0.03
Yield {cd/A}	**Efficacy {lm/W}**		
4.75	525		

Quadrant "2"

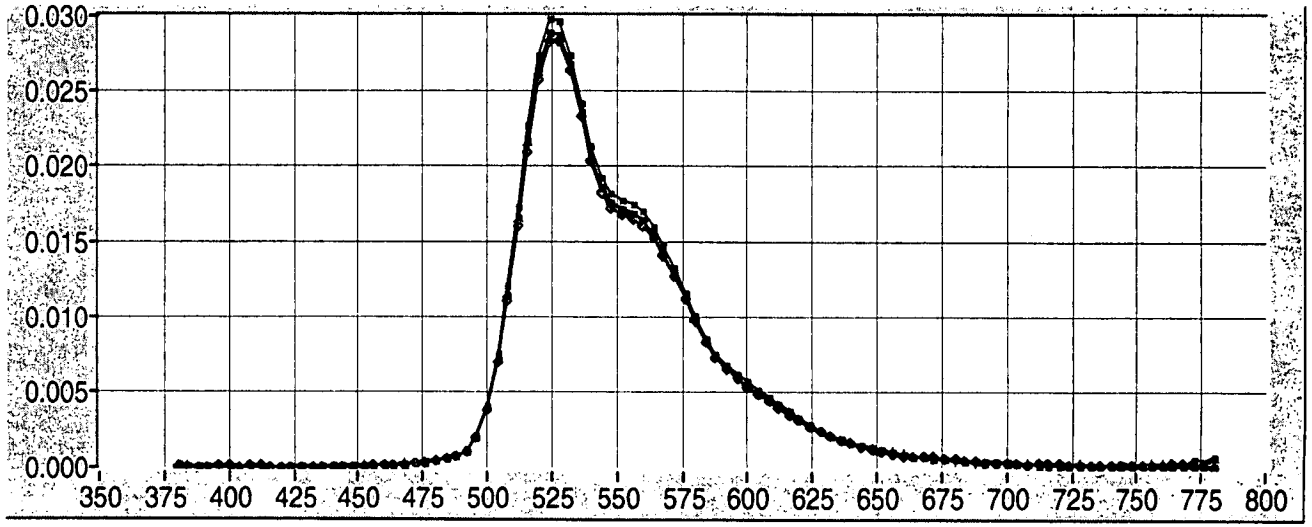
Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	984	1.88	1.81
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.326	0.633	524.0	56.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.56		0.03
Yield {cd/A}	**Efficacy {lm/W}**		
4.92	523		

Quadrant "3"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	939	1.79	1.74
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.327	0.633	524.0	56.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.50		0.03
Yield {cd/A}	**Efficacy {lm/W}**		
4.70	525		

Quadrant "4"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	932	1.77	1.73
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.327	0.633	528.0	56.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.44		0.03
Yield {cd/A}	**Efficacy {lm/W}**		
4.66	526		



Data File Pathname
z:\data\rdio data\lum4nc\LC020614-1-E LUM4NC 6930323.DAT

Write Data File? No Yes

Serial Port {0}: 0

K2400 GPIB Address: 24

Compliance Level: 25

Std Cell 4Qua..i
Z:\Utilities\LabVIEW Tests\RDIO\Std Cell 4Quad.vi
Last modified on 3/12/02 at 9:31 AM
Printed or. Dec 24 4:11 PM

Exhibit B

Standard Cell 4-Quad

>> Enter Panel ID >>
18 Characters Max

LC020614-1-D

Cell Size (cm^2): 100.0E-3

Test Date: 6/14/02
Test Start Time: 4:09 PM
Run Time (sec): 121

Quadrant "1"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1289	2.41	2.48
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.314	0.645	528.0	32.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	8.17		0.04
Yield {cd/A}	Efficacy {lm/W}		
6.45	534		

Quadrant "2"

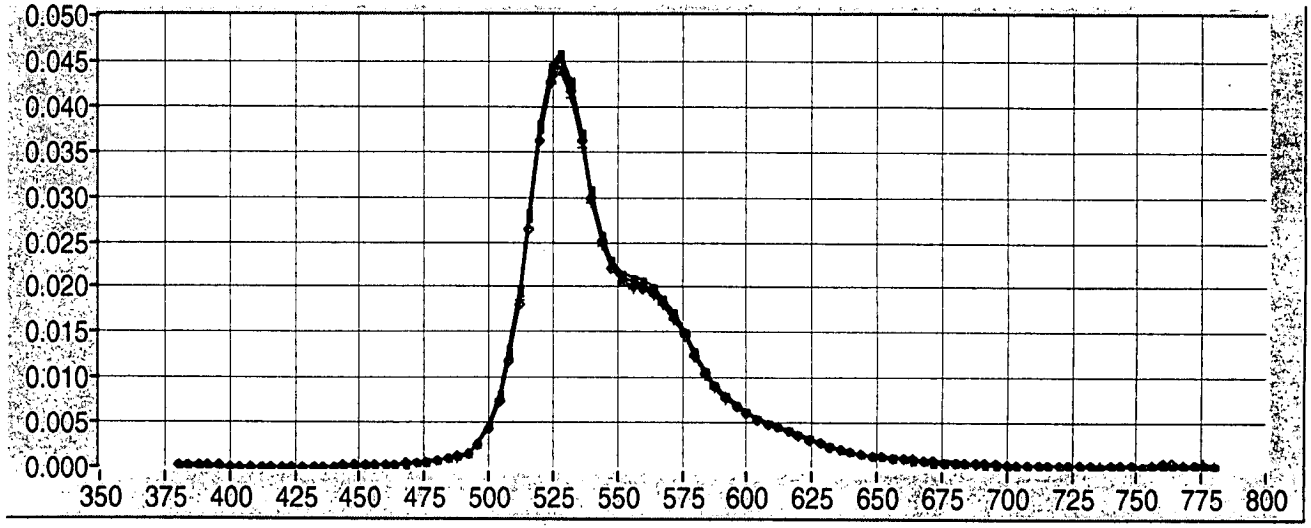
Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1311	2.45	2.48
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.314	0.645	528.0	36.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	8.31		0.04
Yield {cd/A}	Efficacy {lm/W}		
6.56	535		

Quadrant "3"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1248	2.33	2.33
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.315	0.645	528.0	36.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	8.40		0.04
Yield {cd/A}	Efficacy {lm/W}		
6.24	534		

Quadrant "4"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1260	2.36	2.35
x {CIE}	y {CIE}	Peak WL {nm}	Bandwidth {nm}
0.315	0.644	528.0	32.0
Current {mA}	Voltage {VDC}		Efficiency {W/A}
2.000	8.41		0.04
Yield {cd/A}	Efficacy {lm/W}		
6.30	534		



Data File Pathname: z:\data\rdio data\lum4nc\LC020614-1-D LUM4NC 6930144.DAT

Write Data File? No / Yes

Serial Port {0}: 0

K2400 GPIB Address: 24

Compliance Level: 25

Standard Cell 4-Quad

>> Enter Panel ID >>
18 Characters Max

LC020614-1-C

Cell Size (cm^2): 100.0E-3

Test Date: 6/14/02
Test Start Time: 4:06 PM
Run Time (sec): 122

Quadrant "1"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1524	2.85	3.23
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.309	0.649	528.0	32.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.42		0.04
Yield {cd/A}	**Efficacy {lm/W}**		
7.62	535		

Quadrant "2"

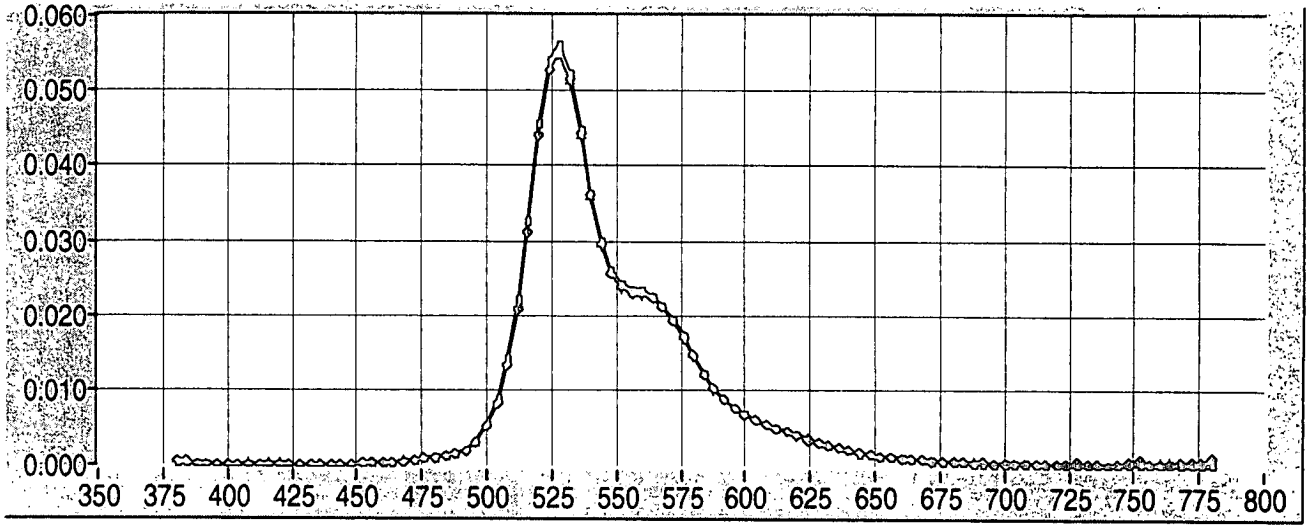
Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1522	2.84	3.19
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.308	0.649	528.0	32.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.50		0.04
Yield {cd/A}	**Efficacy {lm/W}**		
7.61	535		

Quadrant "3"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1485	2.77	3.12
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.310	0.647	528.0	32.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.47		0.04
Yield {cd/A}	**Efficacy {lm/W}**		
7.43	535		

Quadrant "4"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1492	2.80	3.13
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.310	0.647	528.0	32.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.48		0.04
Yield {cd/A}	**Efficacy {lm/W}**		
7.46	532		



Data File Pathname
z:\data\rdio data\lum4nc\LC020614-1-C LUM4NC 6929993.DAT

Write Data File? No Yes

Serial Port {0}: 0

K2400 GPIB Address: 24

Compliance Level: 25

Std Cell 4Qua
Z:\Utilities\LabVIEW Tests\RDIO\Std Cell 4Quad.vi
Last modified on 3/12/02 at 9:31 AM
Printed on Item 2: 4:06 PM

Standard Cell 4-Quad

>> Enter Panel ID >>
18 Characters Max

LC020614-1-B

Cell Size (cm^2): 100.0E-3

Test Date: 6/14/02
Test Start Time: 4:03 PM
Run Time (sec): 150

Quadrant "1"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1727	3.20	3.40
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.310	0.649	528.0	24.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.97		0.05
Yield {cd/A}	**Efficacy {lm/W}**		
8.64	539		

Quadrant "2"

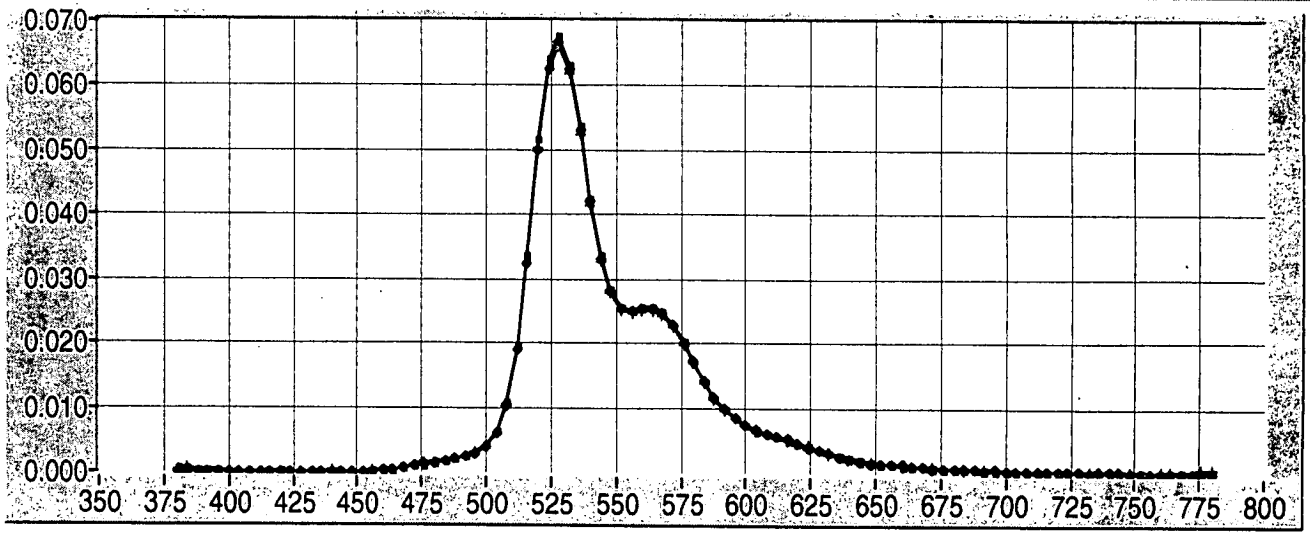
Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1708	3.17	3.33
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.309	0.649	528.0	24.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.05		0.05
Yield {cd/A}	**Efficacy {lm/W}**		
8.54	538		

Quadrant "3"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1683	3.12	3.30
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.311	0.648	528.0	24.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	8.02		0.05
Yield {cd/A}	**Efficacy {lm/W}**		
8.42	539		

Quadrant "4"

Curr Density {mA/cm^2}	Luminance {cd/m^2}	Radiance {W/Sr/m^2}	Efficiency {lm/W}
20.0	1697	3.13	3.37
x {CIE}	**y {CIE}**	**Peak WL {nm}**	**Bandwidth {nm}**
0.311	0.649	528.0	24.0
Current {mA}	**Voltage {VDC}**		**Efficiency {W/A}**
2.000	7.91		0.05
Yield {cd/A}	**Efficacy {lm/W}**		
8.49	542		



Data File Pathname
z:\data\rdio data\lum4nc\LC020614-1-B LUM4NC 6929820.DAT

Write Data File? No / Yes
Serial Port {0}: 0
K2400 GPIB Address: 24
Compliance Level: 25

Exhibit C

Operational Fade @ 20 mA/cm^2

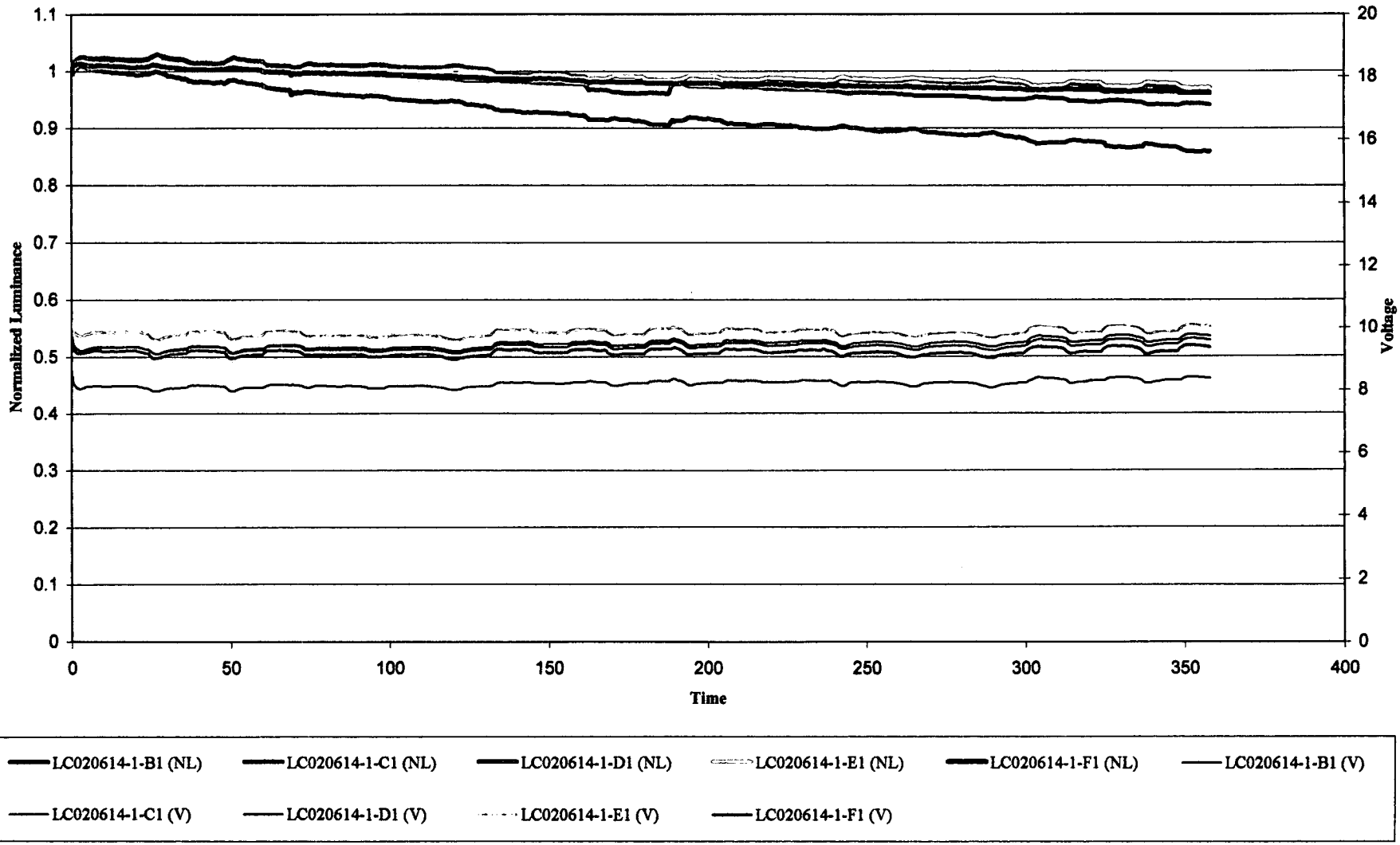


Exhibit C

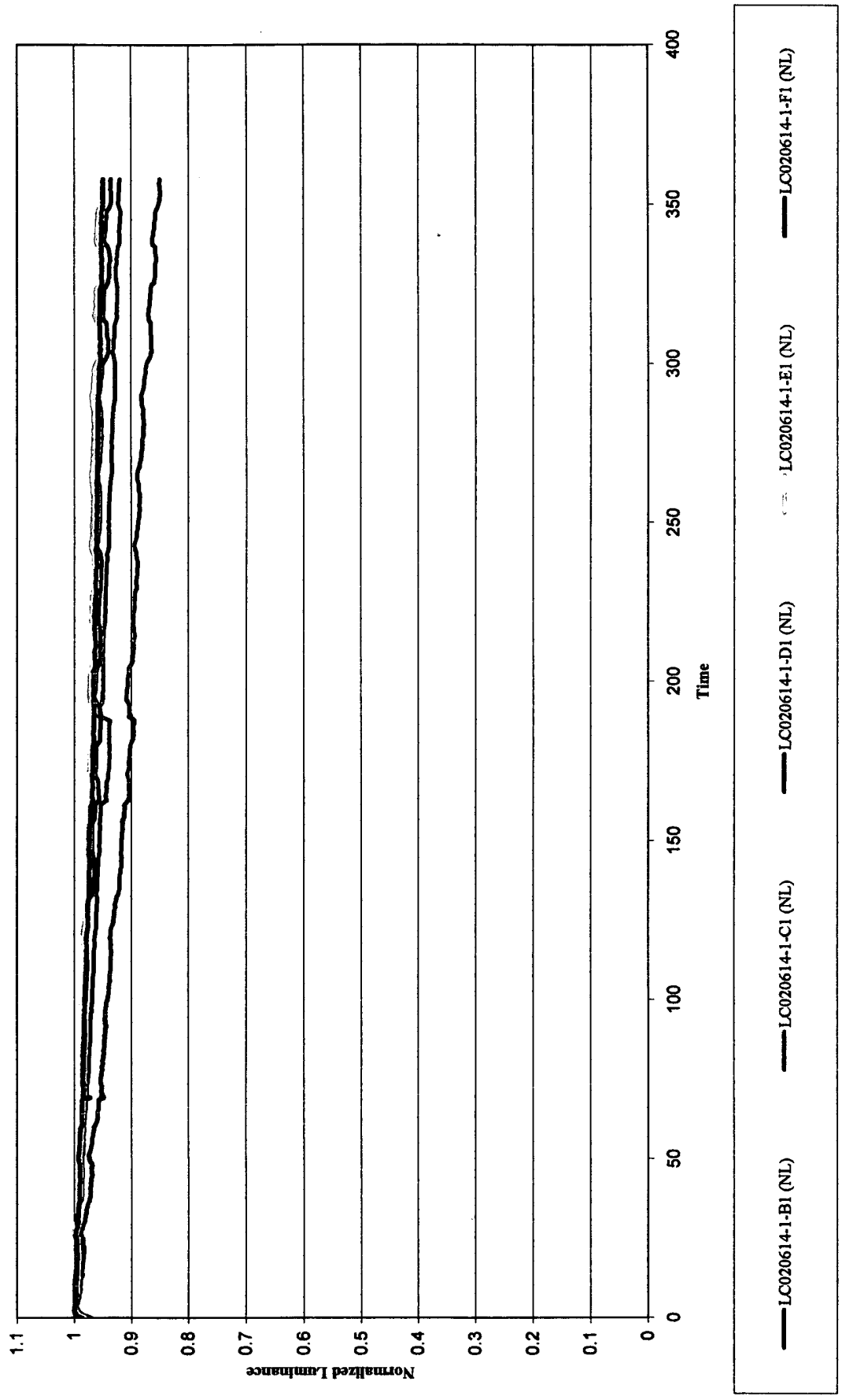


Exhibit Q

Cell ID: LC020614-1-B1 Initial Lumi 1727
Start Date: Item 3
Comments:

d time	V OLED	V Sensor	Lum.	Abs. Lum.	Norm. Lum.
0	9.711	1.743	1	1727	0.989217
0.4	9.494	1.738	0.997131	1722.046	0.986379
0.4	9.492	1.737	0.996558	1721.055	0.985812
0.4	9.488	1.737	0.996558	1721.055	0.985812
0.5	9.485	1.735	0.99541	1719.073	0.984677
0.5	9.47	1.742	0.999426	1726.009	0.988649
0.5	9.468	1.739	0.997705	1723.037	0.986947
0.6	9.466	1.742	0.999426	1726.009	0.988649
0.6	9.46	1.741	0.998853	1725.018	0.988082
0.7	9.435	1.745	1.001147	1728.982	0.990352
0.9	9.409	1.749	1.003442	1732.945	0.992622
1.1	9.383	1.749	1.003442	1732.945	0.992622
1.2	9.37	1.753	1.005737	1736.908	0.994892
1.4	9.355	1.753	1.005737	1736.908	0.994892
1.6	9.335	1.753	1.005737	1736.908	0.994892
1.7	9.331	1.757	1.008032	1740.871	0.997162
1.9	9.321	1.757	1.008032	1740.871	0.997162
2.1	9.305	1.756	1.007458	1739.881	0.996595
2.2	9.302	1.758	1.008606	1741.862	0.99773
2.4	9.294	1.758	1.008606	1741.862	0.99773
2.6	9.28	1.759	1.00918	1742.853	0.998297
2.7	9.283	1.76	1.009753	1743.844	0.998865
2.9	9.281	1.76	1.009753	1743.844	0.998865
3.1	9.275	1.761	1.010327	1744.835	0.999432
3.2	9.282	1.762	1.010901	1745.826	1
3.4	9.285	1.761	1.010327	1744.835	0.999432
3.6	9.283	1.759	1.00918	1742.853	0.998297
3.7	9.297	1.76	1.009753	1743.844	0.998865
3.9	9.303	1.759	1.00918	1742.853	0.998297
4.1	9.305	1.757	1.008032	1740.871	0.997162
4.2	9.319	1.757	1.008032	1740.871	0.997162
4.4	9.326	1.757	1.008032	1740.871	0.997162
4.6	9.324	1.754	1.006311	1737.899	0.99546
4.7	9.341	1.755	1.006885	1738.89	0.996027
4.9	9.347	1.754	1.006311	1737.899	0.99546
5.1	9.347	1.753	1.005737	1736.908	0.994892
5.6	9.362	1.751	1.00459	1734.927	0.993757
6.1	9.38	1.75	1.004016	1733.936	0.99319
6.6	9.39	1.747	1.002295	1730.963	0.991487
7.1	9.404	1.746	1.001721	1729.972	0.990919
7.6	9.405	1.746	1.001721	1729.972	0.990919
8.1	9.41	1.745	1.001147	1728.982	0.990352
8.6	9.407	1.744	1.000574	1727.991	0.989784
9.1	9.409	1.744	1.000574	1727.991	0.989784

Exhibit D

Cell ID: LC020614-1-C1Initial Lumi 1524
Start Date: Item 3
Comments:

d time	V OLED	V Sensor	Lum.	Abs. Lum.	Norm. Lum.
0	8.54	1.586	1	1524	0.976601
0.4	8.287	1.603	1.010719	1540.335	0.987069
0.4	8.285	1.603	1.010719	1540.335	0.987069
0.4	8.279	1.604	1.011349	1541.296	0.987685
0.5	8.277	1.603	1.010719	1540.335	0.987069
0.5	8.26	1.606	1.01261	1543.218	0.988916
0.5	8.258	1.605	1.01198	1542.257	0.9883
0.6	8.254	1.606	1.01261	1543.218	0.988916
0.6	8.248	1.606	1.01261	1543.218	0.988916
0.7	8.223	1.61	1.015132	1547.062	0.991379
0.9	8.198	1.612	1.016393	1548.984	0.992611
1.1	8.175	1.612	1.016393	1548.984	0.992611
1.2	8.157	1.615	1.018285	1551.866	0.994458
1.4	8.141	1.616	1.018916	1552.827	0.995074
1.6	8.122	1.616	1.018916	1552.827	0.995074
1.7	8.115	1.618	1.020177	1554.749	0.996305
1.9	8.106	1.619	1.020807	1555.71	0.996921
2.1	8.094	1.619	1.020807	1555.71	0.996921
2.2	8.088	1.62	1.021438	1556.671	0.997537
2.4	8.083	1.621	1.022068	1557.632	0.998153
2.6	8.076	1.62	1.021438	1556.671	0.997537
2.7	8.083	1.62	1.021438	1556.671	0.997537
2.9	8.083	1.62	1.021438	1556.671	0.997537
3.1	8.084	1.619	1.020807	1555.71	0.996921
3.2	8.094	1.62	1.021438	1556.671	0.997537
3.4	8.098	1.62	1.021438	1556.671	0.997537
3.6	8.098	1.619	1.020807	1555.71	0.996921
3.7	8.115	1.62	1.021438	1556.671	0.997537
3.9	8.125	1.62	1.021438	1556.671	0.997537
4.1	8.132	1.62	1.021438	1556.671	0.997537
4.2	8.143	1.62	1.021438	1556.671	0.997537
4.4	8.148	1.62	1.021438	1556.671	0.997537
4.6	8.142	1.62	1.021438	1556.671	0.997537
4.7	8.149	1.622	1.022699	1558.593	0.998768
4.9	8.147	1.622	1.022699	1558.593	0.998768
5.1	8.142	1.622	1.022699	1558.593	0.998768
5.6	8.143	1.623	1.023329	1559.554	0.999384
6.1	8.151	1.623	1.023329	1559.554	0.999384
6.6	8.16	1.623	1.023329	1559.554	0.999384
7.1	8.17	1.622	1.022699	1558.593	0.998768
7.6	8.17	1.623	1.023329	1559.554	0.999384
8.1	8.173	1.623	1.023329	1559.554	0.999384
8.6	8.169	1.622	1.022699	1558.593	0.998768
9.1	8.159	1.623	1.023329	1559.554	0.999384